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**Datasheet for the decision
of 11 May 2016**

Case Number: T 2085/12 - 3.3.01

Application Number: 06722939.3

Publication Number: 1879967

IPC: C09D5/02, C08L63/00

Language of the proceedings: EN

Title of invention:

METHOD FOR THE ESTABLISHMENT OF A CRACK RESISTANT EPOXY PAINT
COAT AND PAINT COMPOSITIONS SUITABLE FOR SAID METHOD

Patent Proprietor:

Hempel A/S

Opponents:

Jotun A/S
Akzo Nobel Coatings International B.V.

Headword:

Fibre-reinforced epoxy coatings for ballast tanks/HEMPEL

Relevant legal provisions:

EPC Art. 107, 56
RPBA Art. 13(1)

Keyword:

Admissibility of appeal (yes)

Inventive step - obvious solution

Late-filed auxiliary requests - admitted (no)

Decisions cited:

G 0001/12, T 0340/92, T 0920/97, T 0698/10

Catchword:



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Case Number: T 2085/12 - 3.3.01

D E C I S I O N
of Technical Board of Appeal 3.3.01
of 11 May 2016

Appellant 1:
(Patent Proprietor)

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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted on
30 July 2012 concerning maintenance of the
European patent No. 1879967 in amended form.

Composition of the Board:

Chairman	A. Lindner
Members:	G. Seufert
	L. Bühler

Summary of Facts and Submissions

- I. The patent proprietor (appellant 1) and opponents 1 and 2 (appellants 2 and 3 respectively) lodged an appeal against the interlocutory decision of the opposition division on the amended form in which European patent No. 1 879 967 could be maintained.
- II. The present decision refers to the following documents:
- (1) Epoxy Curing Agents and Modifiers, Ancamide[®] 805 Curing Agent, Air Products, Pub. No. 125-9927, May 1999, pages 1 to 12
 - (2) WO 91/10706
 - (6) JP S59-78267
 - (13) C. H. Hare, Paint Film Degradation, Mechanisms and Control, The Society for Protective Coatings, 2001, Pittsburgh (US), pages 147 to 154
 - (15) Hempel Product Datasheet: Hempadur[®] 45141/ Hempadur[®] 45143, November 2003, pages 1 to 2
 - (16) C. H. Hare, Protective Coatings, Technology Publishing Company, 1994, Pittsburgh (US), pages 206, 222, 290, 291, 437
 - (22) The Maritime Safety Committee, Resolution MSC.215(82) adopted on 8 December 2006, pages 1 to 23
 - (26) E. Askheim, J. O. Nøkleby, Protective Coating Europe, March 2001, pages 49 to 55
- III. Notices of opposition were filed by appellants 2 and 3 requesting revocation of the patent in suit in its entirety on the grounds of lack of novelty, lack of inventive step and insufficiency of disclosure (Article 100(a) and (b) EPC).

- IV. The decision under appeal is based on an amended main request and auxiliary requests 1 to 6.

The opposition division held that the various parameters characterising the paint composition were sufficiently disclosed for the person skilled in the art to carry out the invention. The subject-matter of the main request was held to be novel, but the subject-matter of independent claims 14 and 26 was considered to be obvious in view of the combination of either document (2) or document (6) with document (16). The same conclusion applied to auxiliary requests 1 to 5. The subject-matter of auxiliary request 6, in which independent claims 14 and 26 had been deleted, was considered to involve an inventive step. Starting from document (15) as the closest state of the art, the opposition division considered the problem to be solved as the provision of a method for establishing a crack-resistant paint coat with improved properties. The proposed solution, mainly the addition of fibres to the paint composition, was held not to be obvious in view of the available prior art.

- V. With the statement of grounds of appeal, appellant 1 resubmitted the main request underlying the decision under appeal and filed first to fifth auxiliary requests.
- VI. With their statements of grounds of appeal, appellants 2 and 3 maintained their objections of insufficiency of disclosure and lack of inventive step. Appellant 3 also maintained its objection regarding lack of novelty over document (1).
- VII. With letter of 22 April 2013, appellant 1 contested the admissibility of appellant 3's (opponent 2's) appeal.

It was pointed out that opponent 2 was Akzo Nobel Coatings International B.V. The notice of appeal, however, was filed in the name of Akzo Nobel N.V., a company which was not a party to the opposition proceedings and could not have been adversely affected within the meaning of Article 107 EPC.

- VIII. In reply to a communication by the board, in which appellant 3 was invited to comment on this discrepancy, correction of appellant 3's name was requested following the same line of reasoning as in T 340/92.
- IX. With letter of 6 August 2013, appellant 1 requested that the proceedings be stayed until a decision had been reached in the pending referral G 1/12 (identity of appellant) about whether or not such a correction was possible.
- X. In a further communication dated 30 August 2013, the board informed the parties that the proceedings were interrupted until the Enlarged Board of Appeal had come to a decision in the pending case G 1/12.
- XI. Summons to oral proceedings were sent on 25 January 2016. In a communication dated 2 February 2016, the board expressed its preliminary opinion that the mention of "Akzo Nobel N.V." in the notice of appeal was the result of an error and not of a deliberate decision. This deficiency could be remedied in accordance with established jurisprudence of the boards of appeal, which had been fully endorsed by the Enlarged Board of Appeal in decision G 1/12. The board indicated that it saw no reason to doubt that it was the true intention of the professional representative, who was authorised to act for opponent 2, who was adversely affected by the decision posted on

30 July 2012, to file an appeal against this decision on behalf of the same opponent 2 and not on behalf of the affiliated company who was the employer of the professional representative (see also T 920/97, point 1 of the Reasons). Therefore, appellant 3's (opponent 2's) appeal appeared to be admissible.

In addition, the parties were informed that novelty was within the legal and factual framework of the appeal proceedings.

- XII. With letter dated 24 February 2016, appellant 1 filed auxiliary requests A and B. A further auxiliary request C was filed under cover of a letter dated 11 April 2016.

- XIII. Oral proceedings took place as scheduled on 11 May 2016. At the beginning of the oral proceedings, appellant 1 withdrew its previous main request and first, third and fourth auxiliary requests. The second auxiliary request was made the new main request. Auxiliary requests A, B, C and the fifth auxiliary request were maintained. Appellant 1 also withdrew its request that appellant 3's appeal be rejected as inadmissible. In the course of the oral proceedings, appellant 1 also filed an additional auxiliary request, which it named sixth auxiliary request.

- XIV. The main request consists of 15 claims with claim 1 reading as follows:

"1. A method for the establishment of a crack resistant epoxy paint coat at the surface represented by the interior of the angles formed between structural elements of a ballast-tank of a partly or fully submersible structure, said method comprising:

- (i) applying a paint composition comprising an epoxy-based binder system onto said surface thereby forming a curable paint film on said surface, and
- (ii) allowing said curable paint film to cure thereby forming the epoxy paint coat;

wherein the paint composition has a viscosity as determined according to ASTM D562-01 of at the most 140 KU at 30°C and comprises:

35-80% by solids volume of the paint of an epoxy-based binder system having a ratio between the hydrogen equivalents and the epoxy equivalents in the range of 20:100 to 120:100, and

0.5-30% by solids volume of the paint of one or more fibres selected from the group consisting of natural inorganic fibres, synthetic inorganic fibres, natural organic fibres, synthetic organic fibres, and metallic fibres, said fibres having an average length of at the most 250 µm, an average thickness of 1-25 µm and a ratio between the average length and the average thickness of at least 2."

Independent claim 14 is directed to a method for the establishment of a crack-resistant epoxy paint coat at the interior surface of a liquid storage tank comprising the same steps and the same paint composition as in claim 1.

Claim 1 of auxiliary requests A, B, C and the fifth auxiliary request is identical to claim 1 of the main request. Claim 14 has been further amended (auxiliary

requests A, B and C) or deleted (fifth auxiliary request).

Claim 1 of the sixth auxiliary request differs from claim 1 of the main request in that the feature "the surface extending 20 cm from both sides of the junction between structural elements forming the inner surface of a ballast tank and representing an angle of between 45° to 140°" has been added to the preamble.

XV. The arguments of appellant 1, as far as they are relevant for the present decision, can be summarised as follows:

As regards the question whether the first to fifth auxiliary requests were in the proceedings, appellant 1 submitted that auxiliary requests A and B had not been filed to replace those requests. This was clearly apparent from paragraph 2 of appellant 1's letter dated 24 February 2016 and confirmed with appellant 1's letter dated 11 April 2016.

With respect to the issue of inventive step, appellant 1 argued that claim 1 of the main request was directed to stripe coating of critical areas of a ballast tank, such as corners and welds, (cf. document (22), page 3, point 2.11; page 8, point 4). For these particular areas an enhanced risk of cracking existed, caused by excessive dry film thickness and exposure to stress-inducing environmental effects (see patent in suit, Figure 2 and paragraphs [0002] and [0004]). The closest prior art was therefore a document that referred to stripe coating of ballast tanks and addressed the problem of cracking. The only document that met these conditions was document (26), which was also mentioned in paragraph [0003] of the

patent in suit. Document (15) was not a realistic starting point, since it was far too general and did not mention the problem of cracking.

The problem to be solved was defined by appellant 1 as the provision of a method for establishing a coating at the surface represented by the interior angles formed between the structural elements of a ballast tank with improved crack resistance and flexibility while maintaining internal adhesive and mechanical strength. The problem was solved by the addition of fibres of particular shape and dimensions and in a specific amount (cf. tables 4, 5, 6, 8 and 10 of the patent in suit). This solution was not rendered obvious by any document in the proceedings. Documents (13) and (16) would never have been considered by the skilled person without the benefit of hindsight, since they did not concern the coating of ballast tanks and did not address the specific problem related to the coating of the specific surface as defined in claim 1. In particular, they were not related to stripe coating. Furthermore, neither document (13) nor document (16) provided the skilled person with any information regarding the selection of suitable amounts of the fibres or their particular dimensions. Both features, however, influenced the properties of the paints, for example their applicability with a brush or the ease of coating without the fibres becoming too entangled.

In addition, document (26) clearly taught the person skilled in the art that the solution in improving flexibility and, consequently, the crack resistance of epoxy paints for ballast tanks resided in changing the epoxy chemistry (cf. page 49, right-hand column, last paragraph; page 50, lines 31 to 36; page 51, Figure 1; page 51, right-hand column, first paragraph). It

therefore clearly pointed away from the presently claimed solution of adding fibres of particular shape and dimensions and in a specific amount.

Auxiliary requests A, B and C should be admitted into the proceedings. They were an appropriate response to the opposition division's findings with respect to claims 14 and 26 of the main request and auxiliary requests 1 to 5 of the decision under appeal. The amendments in auxiliary requests A, B and C simplified matters and did not raise issues that required postponement of the oral proceedings. The sixth auxiliary request, filed during oral proceedings, should be admitted into the proceedings, since it was a fair attempt to overcome the board's objection with respect to inventive step.

XVI. The arguments of appellants 2 and 3, as far as they are relevant for the present decision, can be summarised as follows:

As regards the question whether the first to fifth auxiliary requests were in the proceedings, appellant 3 submitted that these requests had been replaced by auxiliary requests A and B filed with letter of 24 February 2016 and should not be reinstated.

With respect to the issue of inventive step, appellants 2 and 3 considered document (15) as a suitable starting point for the assessment of inventive step. They submitted that this document disclosed epoxy coatings with the claimed parameters, except for the presence of fibres, for the same purpose, namely the coating of a ballast tank. Such coating meant the coating of all parts of the tank including any corners. The feature "surface represented by the interior angles

formed between the structural elements of a ballast tank" was therefore not a distinguishing feature over document (15). Nor was it relevant that document (15) did not explicitly mention the problem of cracking, since this was a well-known problem with coatings, in particular under the influence of thermal stress or in areas of increased film thickness (see document (13), page 149, left-hand column, lines 23 to 39, page 149, paragraph bridging the middle and right-hand columns). It was also common general knowledge to use fibres, in particular acicular fibres, for reinforcement in order to prevent cracking in films and coatings (cf. document (13), page 150, left-hand column, lines 5 to 23 and lines 33 to 35; document (16), page 291, table 19.2 and page 437, right-hand column, lines 6 to 10). Both documents also explicitly mentioned tank lining as a particular application for fibre-reinforced coatings. The addition of fibres to epoxy paints for ballast tanks, which suffered from the same problem as any film or coating, was therefore an obvious measure for the skilled person faced with the problem of providing a ballast tank coating with improved crack resistance. Concerning the amount and the dimension of the fibres, appellants 2 and 3 argued that there was no evidence of any technical effect related to these features. It was evident that the amount of fibres had to be such that the coating can be readily applied with a brush or by spraying. The dimensions of the fibres (i.e. length and width) were conventional and not significant in solving the technical problem, as already pointed out by the opposition division.

Auxiliary requests A, B and C should not be admitted into the proceedings, since their late filing was not justified by the course of the appeal proceedings. Furthermore, since claim 1 of these requests was

identical to claim 1 of the main request, which according to the board's conclusion lacked inventive step, there was no point in their admission. The amendment in the sixth auxiliary request did not change the scope of claim 1 of the main request. The purpose of the amendment was not clear, since the claim still encompassed the coating of the entire ballast tank.

XVII. Appellant 1 requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request filed as second auxiliary request with the statement of grounds of appeal, or, alternatively, on the basis of any of the following auxiliary requests:

- auxiliary requests A and B filed with letter of 24 February 2016,
- auxiliary request C filed with letter of 11 April 2016,
- the fifth auxiliary request filed with the statement of grounds of appeal, or
- the sixth auxiliary request filed during the oral proceedings.

XVIII. Appellants 2 and 3 requested that the decision under appeal be set aside and that the European patent No. 1 879 967 be revoked.

Reasons for the Decision

1. Admissibility of the appeals

1.1 All the appeals are admissible.

1.2 Appellant 1 initially challenged the admissibility of appellant 3's appeal. In its communication of 2 February 2016, the board expressed its preliminary opinion that "Akzo Nobel N.V." had erroneously been indicated as appellant and that this deficiency could be remedied (see point XI above). Appellant 1 did not contest the board's preliminary opinion and, at the oral proceedings, withdrew its request that appellant 3's appeal be held inadmissible. In the absence of any arguments or evidence to the contrary, the board sees no reason to deviate from its preliminary opinion that the notice of appeal had been filed on behalf of Akzo Nobel Coatings International B.V., a party to the opposition proceedings who was undoubtedly entitled to appeal in the present case. The board therefore allowed appellant 3's request for correction under Rules 101(2) and/or 139 EPC in line with the decision of the Enlarged Board of Appeal G 1/12 (OJ EPO 2014, 114).

2. Procedural matters

2.1 According to appellant 3, the first to fifth auxiliary requests filed with the statement of grounds of appeal had been replaced by auxiliary requests A and B filed with letter of 24 February 2016. As a consequence, the new main request (i.e. previous second auxiliary request, see point XIII above) and the fifth auxiliary request were not in the proceedings, and their reinstatement should be refused. In support of its assertion, appellant 3 referred to page 1, paragraph 2 of appellant 1's letter dated 24 February 2016.

2.2 The board, however, notes that the paragraph relied on by appellant 3 explicitly states that auxiliary requests A and B were submitted as **additional** auxiliary

requests (emphasis added by the board). Although this statement warranted clarification as to the order in which the first to fifth auxiliary requests and auxiliary requests A and B were to be treated, the board has no doubts that the newly filed auxiliary requests A and B were not submitted with the intention of replacing any of the auxiliary requests previously filed.

- 2.3 Consequently, the board concluded that the main request and the fifth auxiliary request were within the appeal proceedings (Article 12(1) RPBA).

Main request

3. Inventive step

- 3.1 Claim 1 of the main request is directed to a method for establishing a crack-resistant epoxy paint coat at the surface represented by the interior of the angles formed between structural elements of a ballast tank of a partly or fully submersible structure. The method comprises the steps of applying a specific paint composition to form a curable paint film and allowing said film to cure to form the epoxy paint coat. The paint composition has a viscosity of 140 KU (Krebs unit) at 30°C and comprises a specific amount of an epoxy-based binder system having a particular ratio of hydrogen equivalent to epoxy equivalents and a specific amount of fibres having an average length of at most 250 µm, an average thickness of 1 to 25 µm and a ratio between the average length and the average thickness of at least 2 (see point XIV above).

- 3.2 The board considers, in agreement with the opposition division and appellants 2 and 3, that document (15)

represents a suitable starting point for the assessment of inventive step. This document discloses two-component, polyamide adduct curable epoxy paints (Hempadur 45141 and 45143), which form hard and tough coatings with good resistance to abrasion, impact and seawater, and their use as ballast tank coatings (see document (15), page 1, first paragraph and point 3 of the second paragraph). Hence, the subject-matter disclosed in document (15) corresponds to the same use or relates to the same technical field as the present invention. The epoxy paints in document (15) have the features specified in claim 1 of the main request, except for the presence of fibres (Hempadur 45143 is described in the patent in suit as epoxy paint according to the invention). This was not contested by appellant 1. The paint is applied by spray or brush (see document (15), page 1, "Application Details"). With respect to the "surface represented by the interior of the angles formed between structural elements", such as corners, welds, etc., the board concurs with appellants 2 and 3 that coating a ballast tank as disclosed in document (15) encompasses the whole tank and includes any corners or welds. There is no indication at all in document (15) that the paints disclosed therein are unsuitable for these parts or that these parts are to be excluded.

In this context, the board also notes that the claimed method is not limited to painting solely the area around the corners or welds of a ballast tank, or to stripe-coating (application of several coating layers) as mentioned in document (22). On the contrary, claim 1 includes methods whereby the entire ballast tank is coated. This is confirmed by paragraph [0022] of the patent in suit, which, as pointed out by the board, explicitly discloses that "The method of the invention

is intended to include applications where the epoxy paint is applied both to the surface represented by the interior of the angles formed between the structural elements and to other surfaces of the ballast tank. The epoxy paint may be applied on the whole surface of the ballast tank or only on parts of the surface as long as parts of the surface applied include parts of the surface represented by the interior of the angles formed between the structural elements."

3.3 Document (26), which appellant 1 considered to represent the closest state of the art, belongs to the same field of application (see page 49, left-hand column, first paragraph and right-hand column, lines 13 to 19). It presents preliminary findings of a project looking into why paints crack, in particular whether different properties of the paints have an influence on the cracking, which properties are critical and how these can be measured. However, document (26) does not disclose epoxy-based paint compositions with the features specified in claim 1 of the main request and therefore differs from the claimed invention in more aspects than document (15). Hence, the board concludes that document (26) does not qualify as a suitable starting point for the assessment of inventive step. For the sake of completeness, the board also notes that document (26) does not refer to stripe-coating, as argued by appellant 1. Furthermore, the mere lack of a reference to a well-known problem with paints and coatings (i.e. cracking as a result of internal stress) is no reason to deviate from document (15) as a suitable starting point for the assessment of inventive step.

3.4 In support of its position that document (26) qualified better than document (15) as the closest state of the

art, appellant 1 referred to the jurisprudence of the boards of appeal, in particular T 698/10. This decision mentions two criteria for identifying the closest prior art. As a first criterion, the closest prior art should disclose subject-matter conceived for the same purpose or aiming at the same objective, corresponding to a similar use, or relating to the same or a similar technical problem, or at least to the same or a closely related technical field. As a second criterion, the closest prior art should disclose subject-matter having the greatest number of relevant technical features in common with the claimed invention.

- 3.5 As set out in points 3.2 and 3.3 above, document (15) fulfils both requirements. The selection of document (15) as the most suitable starting point for the assessment of inventive step is therefore in full agreement with the established jurisprudence of the boards of appeal.
- 3.6 In the light of document (15), the problem to be solved can be seen in providing a method for establishing an epoxy paint coat at the surface represented by the interior of the angles formed between structural elements of a ballast tank with improved crack resistance, in particular improved tensile strength (flexibility), while maintaining the adhesive and mechanical strength of the coat.
- 3.7 The proposed solution is the addition of fibres in an amount of 0.5 to 30% by solids volume of the paint. The fibres have an average length of at the most 250 μm , an average thickness of 1 to 25 μm and a ratio between the average length and the average thickness of at least 2.

In view of the results provided in the patent in suit (cf. tables 4 to 8 and 10), the board is satisfied that the problem as formulated in point 3.6 above is solved.

3.8 It then remains to be decided whether the proposed solution would have been obvious to the skilled person in the light of the prior art and the relevant common general knowledge.

The board concurs with appellants 2 and 3 that the skilled person in the field of paints and coatings would have been aware of the common general knowledge as illustrated in documents (13) and (16).

From this common general knowledge, in particular document (13), which is entitled "Paint Film Degradation, Mechanisms and control", the skilled person at the time the invention was made would have been well aware of the fact that paints and coatings crack as a result of internal stress. Internal stress can be induced by environmental effects, such as severe temperature differences during application in chemically-curing films (which include epoxy paints), high film thickness and shrinkage due to chemical curing and loss of low molecular compounds, such as solvent (see page 149 left-hand column, lines 23 to 39; page 149, middle column last paragraph to right-hand column, line 7; page 149, right-hand column, last paragraph to page 150, left-hand column, line 16). When the stress level exceeds the tensile strength (elongation at break, flexibility) of the film the system fails, i.e. cracks (see page 149, left-hand column, lines 33 to 39; right-hand column, lines 5 to 7; page 150, left-hand column, line 5 to 8). However, document (13) not only discloses that paints and coatings crack and why they do so, it also provides

the skilled person with a solution to this problem, namely the presence of acicular (needle-shaped), fibrous or platy materials (see page 150, left-hand column, lines 16 to 23 and lines 33 to 35). Acicular fibres with a high aspect ratio are particularly suitable (see page 150, right-hand column, lines 15 to 18). The aspect ratio roughly reflects the ratio between length and width of the particles.

The teaching of document (13) is confirmed by document (16). In table 19-2 on page 291, entitled "Particle Shape and Coating Film Properties", the use of acicular pigments in tank linings is disclosed for film reinforcement, cracking and checking resistance, improved durability, mudcracking resistance and texture. Suitable fibres are for example wollastonite or fibre glass, which are also mentioned in the patent in suit as particularly suitable (see patent in suit paragraphs [0040] and [0041]). The beneficial use of fibres is emphasised again on page 437 of document (16) (see right-hand column, lines 6 to 10), where it is stated that "fibrous networks produced throughout the coating tends to reinforce the film giving it properties such as improved crack resistance, impact resistance and even flexibility".

The same problem with cracking due to stress caused by high film thickness or environmental factors, such as temperature differences, also exists in known epoxy coatings for ballast tanks. Excessive dry film thickness is especially observed in areas where the shape of the surface is such that it is notoriously difficult to achieve an evenly thick coating (i.e. corners or welds; see Figure 2 of the patent in suit) and leads to curing shrinkage stress and consequently cracking. This is also acknowledged in the patent in

suit (see background of the invention, paragraphs [0002] to [0005]).

Thus, for the skilled person, in view of his common general knowledge as reflected in documents (13) and (16), the addition of fibres to the epoxy coating of document (15) in order to improve crack resistance and tensile strength, especially in areas with high film thickness, such as corners, welds, etc., would be an obvious measure requiring no inventive ingenuity.

With respect to the claimed amount and the particular dimensions of the particles, the board notes the following:

The claimed ratio between the average length and width, particularly given the examples provided in the patent in suit (see paragraph [0041]), points, not surprisingly, to an acicular shape. As is apparent from documents (13) and (16), this particular shape, as opposed to nodular or spherical pigments, provides the required improvements and is the obvious choice for a suitable particle shape. The choice of the particular average length and average thickness of the fibres has not been shown to result in any particular technical benefit. This choice is therefore neither critical nor purposive for solving the technical problem underlying the present invention. It merely represents an arbitrary choice of no technical significance from within the range of commercially known fibres. Such a choice does not require inventive skills. The same applies to the claimed amount, which achieves no particular surprising or unexpected effect. Moreover, it would be obvious to any skilled person that there are limits to the amount of fibres that can be added to the coating without compromising the intended

application of the paint compositions (i.e. the formation of an evenly thick paint coat by spraying or applying with a brush). Establishing a suitable range belongs to the routine task of a person skilled in the art and does not require inventive skills.

3.9 According to appellant 1, documents (13) and (16) would not have been considered by the skilled person as they were not concerned with ballast tank coating, in particular stripe coating, but rather with highly pigmented paints and heavy-duty mastics for pipelines, exterior coatings such as roof coatings, block fillers, and textured paints. The fibres therein worked as highly effective thixotrops (see document (16), page 437, left-hand column, penultimate paragraph). Moreover, it was apparent from the footnote in table 19-2 of document (16) that the properties of the coating would also be influenced by the particle size, distribution, shape, etc. of the pigment to be used. A careful selection was therefore required. Document (13) also mentioned a different type of coatings (see page 149, right-hand column, first complete paragraph), which requires a further selection. Hence, there was no clear teaching in documents (13) and (16) to use fibres in epoxy coatings for ballast tanks in order to improve flexibility while maintaining the adhesive and mechanical strength of the coating; in particular there was no hint to select the presently claimed amount and dimensions. The presently proposed solution was only obvious with hindsight.

3.10 The board does not agree. As explained in point 3.8 above, cracking due to internal stress caused by environmental factors or unduly high film thickness is a known phenomenon in paints and coatings, and the use of fibres, in particular acicular fibres, to avoid or

reduce this phenomenon is part of the general knowledge of any skilled person working in the field of paints or coatings. Moreover, documents (13) and (16) also explicitly mention tank linings (i.e. coating of the interior surface of a tank) as a potential application of such fibre-reinforced paints or coatings (see document (13), page 149, left-hand column, lines 23 to 39, in particular lines 36 to 39; document (16), table 19-2, second row, third column entitled "Usage"). Hence, the board is convinced that a skilled person faced with the technical problem of improving the crack resistance and tensile strength or flexibility of a paint composition used in ballast tank coatings (i.e. the paints disclosed in document (15)) not only could but also would have added fibres in the expectation of solving the underlying technical problem. There are no reasons apparent to the board that would have prevented the skilled person from applying the known solution of adding fibres to paints for the coating of ballast tanks. Moreover, no particular properties, other than good crack resistance and tensile strength, are required for painting corners, welds or other awkward areas of ballast tanks. There are also no indications at all in the available prior art that the addition of fibres would have an adverse effect on adhesive or mechanical strength that would have deterred the skilled person from their use. On the contrary, according to document (16) the fibrous network produced throughout the coating tends to reinforce the film and improve impact resistance (see page 437, right-hand column, lines 7 to 10).

Appellant 1's argument with respect to the specific amount and dimensions (average length and width) of the fibres are not accepted, for the reasons set out in point 3.8 above. The patent in suit does not contain

any evidence that the amount or dimensions of the fibres are technically significant (i.e. result in a particular effect or advantage) and not merely an arbitrary choice from within the area of known fibres.

- 3.11 For the aforementioned reasons, the board concludes that the subject-matter of claim 1 of the main request does not involve an inventive step (Article 56 EPC).

Auxiliary requests A, B and C

4. Admission into the proceedings

4.1 Auxiliary requests A, B and C were submitted more than three years after filing the grounds of appeal. They constitute amendments to appellant 1's case pursuant to Article 13(1) RPBA and their admission is at the discretion of the board. According to established jurisprudence of the boards of appeal, the board may refuse to consider late-filed requests if they are directed to subject-matter which is clearly not allowable.

4.2 Since claim 1 of auxiliary requests A, B and C is identical to claim 1 of the main request, the board's conclusion that the subject-matter of claim 1 of the main request lacks inventive step would also apply to auxiliary requests A, B and C. Hence, these requests are clearly not allowable under Article 56 EPC. The board therefore decided not to admit them into the proceedings (Article 114(2) EPC and 13(1) RPBA).

Fifth auxiliary request

5. Inventive step

Claim 1 of the fifth auxiliary request is identical to claim 1 of the main request. Therefore, the same observations and conclusion as set out in point 3 above apply, with the consequence that this request must also be refused for non-compliance with Article 56 EPC.

Sixth auxiliary request

6. Admission into the proceedings

6.1 The sixth auxiliary request was filed at the oral proceedings after the board had informed the parties of its conclusion that claim 1 of the main request and the fifth auxiliary request did not involve an inventive step.

6.2 The appellant justified the late filing of the sixth auxiliary request as a direct reaction to the discussion that had taken place during oral proceedings and as an attempt to overcome the board's findings.

6.3 However, the issues related to Article 56 EPC, including the relevance of the allegedly specific surface to be coated, already formed part of appellant 2's and 3's statement of grounds of appeal and their reply to appellant 1's statement of grounds of appeal. No additional objections under this article were raised during the oral proceedings. Therefore, appellant 1 could and should have filed the sixth auxiliary request, if it considered it necessary, at an earlier stage in the proceedings.

Furthermore, even if the board were to accept that claim 1 of the sixth auxiliary request is limited to a particular surface (i.e. a surface extending 20 cm from both sides of the junction between the structural

elements), it is not immediately apparent how this amendment can overcome the objection of lack of inventive step. In particular, it is not immediately apparent why the obvious solution of using fibres to improve crack resistance would not be applicable or would not be considered by the skilled person for a surface which is particularly susceptible to cracking.

6.4 For the aforementioned reasons, the board decided not to admit the sixth auxiliary request into the appeal proceedings (Article 114(2) EPC and Article 13(1) RPBA).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



M. Schalow

A. Lindner

Decision electronically authenticated